Fact Sheet

Aquifer Protection Permit
Inventory # 101546
Place ID 133193, LTF # None
BHP Copper Inc., Miami Unit

The Arizona Department of Environmental Quality (ADEQ) proposes to issue an aquifer protection permit for the subject facility that covers the life of the facility, including operational, closure, and post closure periods unless suspended or revoked pursuant to Arizona Administrative Code (A.A.C.) R18-9-A213. This document gives pertinent information concerning the issuance of the permit. The requirements contained in this permit will allow the permittee to comply with the two key requirements of the Aquifer Protection Program: 1) meet Aquifer Water Quality Standards at the Point of Compliance; and 2) demonstrate Best Available Demonstrated Control Technology (BADCT). The purpose of BADCT is to employ engineering controls, processes, operating methods or other alternatives, including site-specific characteristics (i.e., the local subsurface geology), to reduce discharge of pollutants to the greatest degree achievable before they reach the aquifer or to prevent pollutants from reaching the aquifer.

I. FACILITY INFORMATION

Name and Location

Permittee's Name:	BHP Copper Inc.
Mailing Address:	BHP Copper Inc. Pinto Valley Operations P.O. Box 100 Miami, AZ 85539
Facility name and location:	BHP Copper Inc., Miami Unit Highway 60/70 Miami, AZ 85539

Regulatory Status

While owned by Magma Copper Company, a Notice of Disposal (NOD) was submitted for the site in July 1987. A Groundwater Protection Permit No. G-0008-04 was issued in May 1988 for the reprocessing of the No. 2 Tailings at the Miami Unit. In November 1996, Arizona Department of Environmental Quality (AZDEQ) received an Aquifer Protection Permit application from BHP.

The BHP-Miami mine facility is located within the Pinal Creek Water Quality Assurance Revolving Fund (WQARF) site. The Pinal Creek WQARF site includes the Phelps Dodge, Inc., Phelps Dodge Miami Mine, formerly known as the Inspiration Mine and BHP Copper, Inc., BHP Miami Mine, BHP Copper Cities Mine, the Old Dominion Mine, the Solitude Tailings, and related properties.

Certain source control actions at the WQARF site began in 1986 under an order from the Environmental Protection Agency (EPA) for violations of the Clean Water Act. In 1989, the Pinal Creel site was listed on the WQARF Priority List (and later the WQARF Registry) by the State of Arizona and the Pinal Creek Work Group (consortium of Phelps Dodge Miami (formerly Cyprus Mining Co.), BHP Copper Inc. (formerly Magma Copper Co.) and Inspiration Consolidated Copper Co.), was formed to conduct the remedial actions.

In 1997, a Consent Decree governing the clean up was signed, and was approved by the United States District Court in 1998. While the Consent Decree awaited court approval, an administrative consent order was signed in 1998 to implement an early response action to expedite the construction of a groundwater treatment plant, remove contaminated groundwater at the leading edge of the acid-metal plume, and to prevent further degradation of the perennial reach of Pinal Creek.

The major contaminants of concern at the Pinal Creek WQARF site include aluminum, arsenic, beryllium, cadmium, chromium, copper, cobalt, fluoride, iron, lead, manganese, mercury, nickel, radium, sulfate, total dissolved solids, uranium, and zinc.

Various remedial actions at the Pinal Creek WQARF site have been conducted to date and include: groundwater extraction from the alluvial aquifer, groundwater containment, groundwater slurry walls, a private well replacement program, risk assessments, groundwater and source control feasibility studies, facility upgrades, closure of impoundments, capping of tailings/waste rock piles, pumpback systems, storm water controls, and the construction of two lime neutralization treatment plants.

The Miami mine site contains various facilities. In addition to those covered by this APP, some facilities are exempt for APP purposes because they are subject to WQARF, predate the APP Program and/ or are being closed under the WQARF Program. The reprocessing and removal of Tailing No 2, which occupies the southeastern most portion of the site, was regulated under the APP Program for the mining of the tailings to extract copper, however, the removal of the Tailings No 2 as source area, was governed by WQARF Program.

Facility Description

The Miami Unit is a historical copper mine located near Miami, Arizona. Previous mining operations have included underground mining using block caving methods, ore processing and tailings deposition.

Current operations authorized by this permit include an in-situ leaching operation. The in-situ leaching operation consists of approximately 168 acres which produce copper by acid-treating material remaining from historic underground mining of a large, disseminated copper ore body. The leaching of the abandoned underground

workings and former block caved zones of low grade chalcocite and chalcopyrite began in 1941 and is estimated to continue to the year 2036. Typically, acid is injected into thousands of injection wells and recovered through extraction wells, nearby shafts and an open pit. The recovered solution is processed through a solvent extraction-electrowinning (SX-EW) plant that produces refined copper cathodes.

The Miami Unit No. 2 Tailings Reprocessing Project was permitted under Groundwater Protection Permit No. G-0008-04 in 1988. Approximately 38 million tons of mill tailings were placed in the Miami Unit No. 2 Tailings Facility between 1911 and 1934. The tailings were reprocessed using hydraulic mining methods from 1988 to 2001. The hydraulic mining methods produced a slurry which was processed though the tailing reprocessing facility. The spent tailings were transported through an overland pipeline and deposited into an off-site former open pit known as the Copper Cities Deep Pit Tailings Repository (permitted under a separate APP #101888). The overland pipeline from the Copper Cities Deep Pit Tailings Repository returns reclaimed water to the BHP Miami Unit to use in the current in-situ leach process area. The Copper Cities Deep Pit Tailings Repository also serves as storage for excess leach solution from the Miami Unit. The remaining five million tons of tailings left behind from the No 2 Reprocessing Project were recently graded, capped and reclaimed as part of a Source Remediation Plan for the Miami Unit as related to the Pinal Creek WQARF site.

Closure Description

A Closure Plan for non-operating facilities is required as part of the Compliance Schedule

II. BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY (BADCT)

The Compliance Schedule contains requirements for upgrades to the existing APP facilities to ensure that they meet the requirements for existing facility BADCT.

III. COMPLIANCE WITH AQUIFER WATER QUALITY STANDARDS

Monitoring and Reporting Requirements

A one time discharge characterization sampling event is required at Catchment 3. The discharge characterization shall be analyzed for the following constituents: pH, temperature, specific conductance, total dissolved solids, total alkalinity, carbonate, bicarbonate, hardness, hydroxide, calcium, bromide, chloride, fluoride, magnesium, nitrate, total nitrogen, total, Kjeldahl nitrogen, total coliform, fecal coliform, sulfate, magnesium, potassium, sodium, aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, mercury nickel, selenium, thallium,

zinc, hydrocarbons, total petroleum hydrocarbons, and volatile organic hydrocarbons.

Groundwater occurs in three different geological units: the alluvial aquifer, the Gila Conglomerate aquifer and the bedrock aquifer. Shallow, discontinuous groundwater occurs in the alluvial aquifer between 49 to 72 feet below ground surface (bgs). Unconfined groundwater occurs in the Gila Conglomerate between 48 to 270 feet bgs, east of the Miami Fault. The fractured bedrock aquifer contains unconfined groundwater at 226 to 360 feet bgs.

The BHP Miami site is divided into two major drainage Sub-basins: the In-Situ Leaching Area and the No 2 Tailings Area. Groundwater flow direction in the In-Situ Leaching area is controlled by active pumping at the TJ Pit, extraction wells, and the No 5 Shaft. Two cones of depression are present within the Sub-basin due to groundwater pumping at the extraction wells near the TJ Pit and at the No 5 Shaft. In the south eastern boundary of the In-Situ Leaching Area, the groundwater outside the boundary of the active pumping zone, appears to flow to the southeast towards Bloody Tanks Wash. The Miami Faults bisects the southern In-Situ Leaching area, and groundwater elevations on western side of the Miami Fault are approximately one hundred feet less in elevation, than on the eastern side of the Fault. Additional groundwater investigations, particularly groundwater flow direction and groundwater quality along the Miami Fault, south of the In-Situ Leaching Area will be required. Groundwater in the Tailings No 2 Sub-basin tends to follow the general topography and flows southeastern toward Bloody Tanks Wash.

Points of Compliance (P.O.C)

Four monitor wells designated as POC wells, are listed in Section 2.4. Three of the POC wells MU-955, MU-962 and MU-957are currently installed at the facility. The remaining POC well, POC-1 will require new installation approximately 200 feet down gradient of the SX/EW spill containment pond. POC-1must be installed within four months from the issuance date of the APP. Additional POCs may be warranted based upon the BADCT demonstration for the in-situ leaching area as required by the Compliance Section in Section 3.0 of the permit. Groundwater monitoring and reporting is required under the WQARF Program for the Tailings No 2 Area.

The permit requires eight monthly groundwater sampling events to establish Alert Levels (ALs) and aquifer quality limits (AQLs) at the point of compliance. The monitoring program will include the collection of groundwater elevations and groundwater samples. The groundwater samples will be analyzed for the following constituents: pH, temperature, specific conductance, total dissolved solids, carbonate, bicarbonate, fluoride, nitrate, sulfate, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, mercury nickel, selenium, thallium, and zinc. At the conclusion of the eight monthly groundwater

sampling events, the permittee is required to submit an Ambient Groundwater Monitoring Report to propose ALs and Aquifer Quality Limits AQLs. Either a numeric value or no numeric value ("Monitor") will be amended for each AL and AQL designated as "reserved". Once these limits are established, a quarterly compliance sampling program will be initiated at the POC and will be analyzed for the same constituents as required under the ambient groundwater sampling list. The extended list of parameters to be monitored biennially in the POC well include: pH, temperature, specific conductance, total dissolved solids, total alkalinity, carbonate, bicarbonate, hydroxide, calcium, bromide, chloride, fluoride, nitrate, sulfate, magnesium, potassium, sodium, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, mercury nickel, selenium, thallium, zinc, hydrocarbons, volatile organic hydrocarbons, gross alpha particle activity, total uranium, and radium 226 + radium 228, total petroleum hydrocarbons, benzene, toluene, ethylbenzene, and total xylenes.

IV. STORM WATER and SURFACE WATER CONSIDERATIONS

The major surface water feature within the Miami Unit is Bloody Tanks Wash located along the southern boundary of the mine site. Surface water courses at the site principally drain southeastward. Bloody Tanks Wash and the associated alluvial aquifer is currently being monitored and remediated by the WQARF program.

The In-Situ Leaching area is drained internally by several incised channels along the fringe of the In-Situ Leaching Area. These drainages channel the storm water and process fluids related to the leaching operation toward the TJ Pit. The storm water and leach fluids which drain to the TJ Pit are extracted via the underground working and the No 5 Shaft.

Surface water drainages within the reclaimed Tailing No 2 area are controlled with BMP's and may discharge to Bloody Tanks Wash.

Multiple storm water facilities exist at the Miami Unit along Miami Avenue prior to surface water entering Bloody Tanks Wash. The Miami Storm Water Control facilities consist of ditches, culverts, and sediment traps. The purpose of the storm water facilities is to reduce the effects of storm water on Miami Avenue and direct clean storm water flow to Bloody Tanks Wash.

Several surface water springs were identified at the mine site. The springs are ephemeral in nature, and are related to the In-Situ Leaching project.

V. COMPLIANCE SCHEDULE

The APP for this project contains compliance schedule items that must be addressed as a requirement of permit issuance.

VI. OTHER REQUIREMENTS FOR ISSUING THIS PERMIT

Technical Capability

BHP Copper Inc. has demonstrated the technical competence necessary to carry out the terms and conditions of the permit in accordance with A.R.S. § 49-243(N) and A.A.C. R18-9-A202(B).

ADEQ requires that appropriate documents be sealed by an Arizona registered geologist or professional engineer. This requirement is a part of an on-going demonstration of technical capability. The permittee is expected to maintain technical capability throughout the life of the facility.

Financial Capability

BHP Copper Inc. has demonstrated the financial responsibility necessary to carry out the terms and conditions of the permit in accordance with A.R.S. § 49-243(N) and A.A.C. R18-9-A203. The permittee is expected to maintain a financial assurance mechanism throughout the life of the facility.
The estimated dollar amount demonstrated for closure and post-closure costs is $5,035,298.

Zoning Requirements

Mines are exempt from zoning requirements per A.R.S. § 11-830.

VII. ADMINISTRATIVE INFORMATION

Public Notice (A.A.C. R18-9-108(A))

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft permit or other significant action with respect to a permit or application. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to a permit application or permit. This permit will be public noticed in a local newspaper after a pre-notice review by the applicant and other affected agencies.

Public Comment Period (A.A.C. R18-9-109(A))

The aquifer protection program rules require that permits be public noticed in a newspaper of general circulation within the area affected by the facility or activity and provide a minimum of 30 calendar days for interested parties to respond in writing to ADEQ. After the closing of the public comment period, ADEQ is required to respond to all significant comments at the time a final permit decision is reached or at the same time a final permit is actually issued.

Public Hearing (A.A.C R18-9-109(B))

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be held if the Director determines there is a significant amount of interest expressed during the 30-day public comment period, or if significant new issues arise that were not considered during the permitting process.

VIII. ADDITIONAL INFORMATION

Additional information relating to this proposed permit may be obtained from:

Arizona Department of Environmental Quality
Groundwater Section – APP & Drywell Unit
Attn: Barry Rechtorovich, Project Manager
1110 W. Washington St., Mail Code 5415B-3
Phoenix, Arizona 85007
Phone: (602) 771- 4789